CS413 – Group 3 Phase 1

# An assessment of the capabilities of the device(s) and the agreement on the idea for the gadget

# Bluetooth speaker with equaliser We came up with four main ideas and conducted a feasibility study on each.

# Bluetooth speaker with equaliser

# Description

One idea was to create a Bluetooth wireless speaker that we could connect to from and Bluetooth able device which has the capability to play music. In addition the device would have a touch screen component which could be used to turn up the bass, mid and high. The effects of altering the audio settings would be visualised through a digital screen with an equaliser.

# Feasability

|  |  |  |
| --- | --- | --- |
| Technical | Financial | Time |
| We would have to investigate how to connect to a bluetooth receiver securely. We would proabably have to define some kind of protocol to ensure only 1 device can connect at a time.  We would have to develop a touchscreen UI for the volume, bass, mid and high controls.  We would have to work out how to create the graphics for the equaliser. It shouldn’t be too difficult and there are Arduino tutorials in how to do this. | We would have to pay for a touch screen (£30 on amazon for an Arduino compatible touch screen).  And a digital screen (Arduino compatible digital screen £6 on amazon).  Bluetooth receiver (Arduino compatible Bluetooth receiver £13). We could buy a couple of cheap speakers for < £10 each So around £15-20 each for everything. The speaker casing can be made from lego. | We feel that this idea would be possible to implement in the allocated time. |

1.2. Mechanical Rubix

## Feasability

|  |  |  |
| --- | --- | --- |
| **Technical** | **Financial** | **Time** |
| Unsure of mechanical design  Didn’t know what would hold the cube in place when it was being shuffled.  We feel the level of precision required by the shuffling mechanism (a mechanical arm or an axel) would be too difficult to get right in the time allocated for the task.  We also dare unsure how the device would be able to tell when the rubix cube was solved. | Cann’t decide on technical requirements meaning we can’t make any estimates on the financial requirements i.e. whether the device would have mechanical arms to shuffle the rubix cuuibe, or whther the rubix cube would sapin on an axel/axels. | N/A |

## Idea

1. diagnostic tool for car

Description

My idea was a raspberry pi that connects to a car via OBC2

and have some sort of interface so the user can see stats about their car

* current mph,
* mpg,
* 5fuel intake
* gps that tracks the cars movement so you can see where the car has been
* where and the status of the car at any point in the journey.

I already have the OBD2 to USB connector and there is a library already available for OBD2 stuff for python (https://github.com/martinohanlon/pyobd). Mark also has experience building iPhone apps and already has an apple dev membership so that might come in handy too

**Record journeys in car with GP (attach to raspberry pi usb)**

**Send data across to your iphone.**

**FM Transmitter**

**Dashboard online service (upload to web server)**

**Braking too harshly (sudden decrease of speed)**

Knowing the speed limits on the road?

Possibly reroute other cars depending on where you are

How much fuel you were using.

Can check detailed information like pistons

Speed cameras coming up

Let you know if there is something wrong with the car

Efficient Driving, could tell you if you are revving too much.

Give you feedback at the end on how you could drive more efficiently

Motion Detectors going round corners, braking.

Feedback through the car speakers

Compare friends results (back end, web server)

Separating different drivers in one session, having a button you press on the

Connect it to the car, go for a drive get some data together, unplug, connect to network, submit results to web server.

Mobile app or User interface just views the data on the web server, or if we have something realtime just display what we have on the raspberry pi

martinohanlon/pyobd

## Feasability

|  |  |  |
| --- | --- | --- |
| **Technical** | **Financial** | **Time** |
| Python is the recommended language to use with raspberry PI  Python is the language used for the OBD2 stuff  Library is readily available  Mark has apple dev membership if we wanted to do a mobile app.  Decide what we wanted to do with the data  Record during the journey and analyse afterwards  During the journey, display a particular bit of information that is not going to distract you from driving.  Simulating tests when you don’t have a car.  Get this sorted out early, 2/4 don’t have a car.  Technically it is about the GPS and how we display the information | Wouldn’t have to buy Apple membership  Already got connector for OBD2  Buy a GPS component | Patrick, Marc both know python so no time issue for learning it  Mark Provan knows ios apps.  Decide what we wanted to do with the data |

Advantages

* Could take Duncan for a drive
* All the data is already there
* So many different ways we could analyse the data/ use it in real-time

Disadvantages

github.com

1. true or false quiz asks questions using automatically generated speech from a speaker

uses a camera to detect thumbs up, smile or nod for yes, then thumbs down etc for no

## Feasability

|  |  |  |
| --- | --- | --- |
| **Technical** | **Financial** | **Time** |
| We could record questions but that limits us in what questions we could ask and we would have to add audio files to the device. (content management)  Text to speech would not be difficult to implement  Image recognition for thumbs up, smile, nod  Phone face up or down and use accelerometer to detect how you answered.  Use a glove for thumbs up. Would be more of a hardware concept whereas using image recognition  Coloured Cards red for no  Green for yes  Colourblindness?  Possibly use the Kinect  What happens if you show both cards? Or thumbs up thumbs down  How do you know when to take the photo? | Camera?  Speaker?  Web cam plugged into usb of raspberry pi? | Image recognition would take a fair bit of time, some kind of algorithm  Constructing quizzes would take time |

1. The investigation of the development environment for the device(s) and to confirm their functionality.
2. Identification of any additional resources required for the gadget within the likely constraints of availability and affordability – there is a very limited development budget!
3. Planning: A plan needs to be drawn up that identifies the major goals, time estimates and deadlines for the project and the distribution of tasks amongst the group members.
4. Design: It is important to the overall success of the project that a disciplined design approach is undertaken so that the implementation phase is straight forward.